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The Historical and Scientific Society
of Manitoba.

MANITOBA BIRDS OF PREY

And the Small Mammals Destroyed
by Them.

By

A. E. ATKINSON,

A Corresponding Member of the Society.

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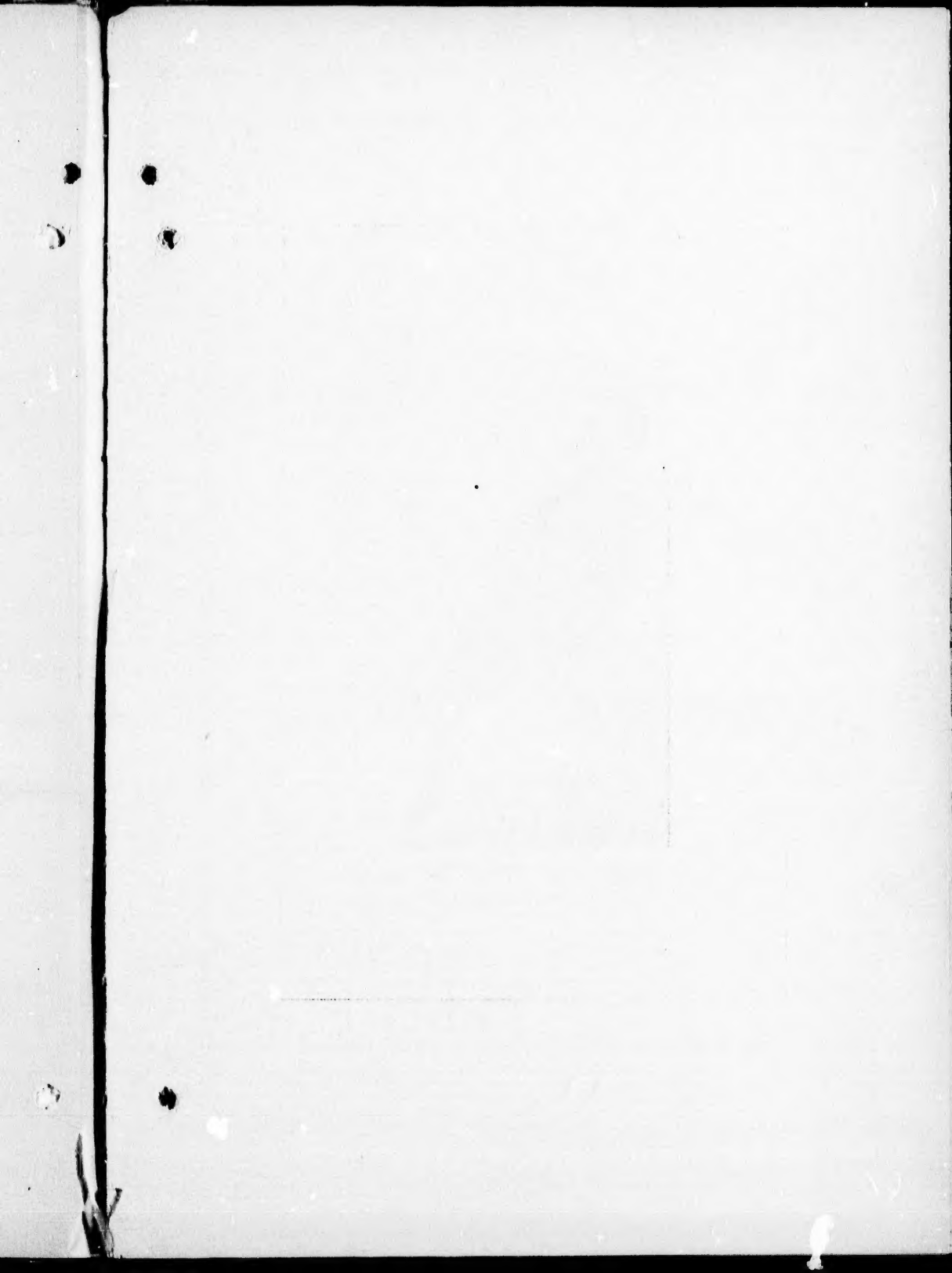
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AMERICAN GOSHAWK.
(*Accipiter Alricapillus.*)

MANITOBA BIRDS OF PREY.

The Historical and Scientific Society of Manitoba met in the City Hall, Winnipeg, on the evening of 8th December, 1898. A good audience was present to examine the specimens of the predaceous birds of Manitoba prepared by the lecturer of the evening, Wm Clark, Esq., Chief Factor of the Hudson's Bay Company, President of the Society, took the chair. Mr. Geo. E. Atkinson, a corresponding member of the Society, read the following paper on the "Birds of Prey of Manitoba."

As Manitoba is an agricultural province, natural or artificial conditions which affect the farmer become objects of interest to the whole community.

The increasing numbers, and consequent increasing destructiveness of the gophers, mice, and in some places, rabbits, are becoming grave questions for the agriculturist to handle.

This latter increase is what particularly interests us in this paper and when asked the cause, we reply, that it is largely because nature's enemies to these pests have been ruthlessly persecuted and slaughtered. Birds of prey have been allotted a portion of the task of maintaining the limit of this class of animals, and the removal of hawks and owls permits of the undisturbed increase of gophers and mice.

There is in the mind of the average farmer sportsman a prejudice in regard to hawks and owls which is so firmly rooted that it is impossible to eradicate it, and if opportunity presents itself, he will never fail to vent his spleen upon the unfortunate hawk, and all simply because of the loss of an occasional fowl. Yet he will pet and feed in laziness and luxury that model of iniquity and deception—the house cat—which will sneak about under cover of darkness and protection and destroy more chickens and small birds in one night than a hawk or owl would in a lifetime. I feel satisfied that were the farmers to dispense with the domestic cat, close up the hen coops at night and be compelled by law to give up their unrighteous persecution of hawks and owls, these rodent pests would materially diminish, as would also the poultry

losses. Such I fear will never be accomplished until a different system of education is adopted among farmers and more attention is given to economic natural history in our schools and agricultural colleges.

I propose in this paper to prove very great economic values for these persecuted creatures, as deduced from practical experiences of the most prominent authorities on the subject.

I regret to say that our Canadian Governments have never made an effort to obtain practical information on these subjects from our own country, and that all our bird laws are made by guess work.

The American Agricultural Bureau has done much in the shape of practical investigation, and it is to their reports I must turn for the verification of statements made here to supplement my own experiences.

The stomach records appended to each species are from the report of Dr. A. K. Fisher, of the U.S. Bureau of Agriculture on Hawks and Owls, and are taken from a total examination of some 2690 stomachs collected in various parts of the United States and Canada.

The birds of prey are distributed over the whole land surface of the globe, represented alike in frigid and tropical zones. There are about 60 species in North America. According to their varied characteristics they are divided into three groups, viz.: Cathartidae, Falconidae, Strigidae.

1. Cathartidae—Includes the vultures and kindred carrion feeding forms, which are mostly inhabitants of tropical or semi-tropical countries, where nature has allotted to them the position of scavengers or cleansers, and so thoroughly do they perform their work that they are usually looked upon with great favor in the warmer southern countries, and heavy penalties are imposed upon anyone found destroying them, and in many places the vultures may be seen at any hour of the day soaring high in the air, keenly alert for dead or dying creatures or perched upon a prominence awaiting the last dying struggles

of some unfortunate deer in the forest or homeless dog by the wayside, or struggling together in the gutters of the city or town for the refuse matter left there for them.

The construction of the birds are in every way suited to the work they have to do. Having acquired the fondness for carrion they have lost most of the grasping powers in the foot possessed by the other families of Raptores, as well as the dash and courage which is characteristic of all these forms which catch their prey alive and kill it. They have, however, acquired a very heavy, strong foot, tarsus and bill, the end of the latter being exceptionally strong and sharp pointed, while both bill and feet are especially adapted for tearing apart the tough skins and other portions of the deceased creatures they frequently feed upon. They are very sociable, but exceedingly voracious, frequently gorging themselves until they are unable to arise from their feasting grounds, at which times, if one is not overcome with the very unpleasant odor which is characteristic of the birds, they may be captured with little or no trouble, as they seldom show fight, and only express approval or disapproval of anything by feints or passes and low guttural grunts or hisses. They are possessed of exceptional wing area and power of flight, being one of the most remarkable soaring families in the world. They rise from the ground with a few lazy beats of wing and scar off with or against the wind, turning, rising or falling at will without any perceptible muscular exertion and are able to continue this performance for hours without a beat of the wing.

The head and neck are usually bare of feathers and sparsely covered with short fine hairs, the skin hanging in wrinkles on the neck, like that of the turkey.

The only Manitoban, and, in fact, the only Canadian species of this family is the Turkey Vulture (*Cathartes aura*), frequently designated the wild turkey by many intelligent persons, on account of the resemblance of the head and foot of the bird to that of the turkey. The Turkey Vulture is strictly migratory with us, and ranges over the whole province. They are to be found usually in the vicinity of slaughter houses or other places where refuse animal matter is deposited, and are usually difficult of approach, particularly on their first appearance in the spring. They arrive here about the middle of May, and breed, no doubt, in the less frequented districts. The nest is placed in a prostrate hollow log or stump, or on the ground under bushes. The eggs are either one or two in number and are a

creamy white, blotched or spotted irregularly with dark brown. I have in two seasons received two and observed five other specimens in the vicinity of Portage la Prairie. They leave us some time during September.

A peculiar habit of playing 'possum by feigning death when wounded and captured is credited to this species by Dr. Cones, who says, "the first is admirably executed and frequently long protracted."

II. FALCONIDAE.

Of this family more may be said of local interest, as we have some 17 species locally represented, which according to their various peculiar characters and their



Red tailed Hawk.

(*Buteo borealis*)

economic relations to agriculture, I propose to divide into three groups, which shall be known as Wholly Beneficial, Mostly Beneficial and Harmful species. I will endeavor to point out the means of distinguishing one group from another, in order that the innocent may cease to be punished for the guilty.

In the Wholly Beneficial class I place two species of the genus *Archibuteo*, viz.: *A. lagopus Sancti Johannis*, and *A. ferrugineus*. The former is a common species with us, the latter only an occasional visitor from the south and west, and the strongest proof of their beneficial qualities is the fact that in all the stomachs examined no trace could be found of poultry, game or small birds, while 92 per cent.

contained mice and other injurious mammals and insects, the other 8 per cent. being empty.

The rough-legged Hawk is a large winged but shall footed bird, and is wholly incapable of destroying poultry or large game, while stomachs of birds secured where waterfowl were abundant revealed no change from the ordinary diet of mice and insects. It is somewhat crepuscular in its habits, being more on the alert during twilight or early dawn, when those pests which constitute its prey are beginning to stir, and before the owls or other hawks have begun to hunt. They range far northward and do an immense amount of good work in keeping in check the numbers of injurious forms which abound in the less settled country, and which become a devastating plague at times, when they reach an agricultural district.

Sir John Richardson, in his notes, species as follows: "In the softness and fullness of its plumage, its feathered legs, and its habits, this bird bears some resemblance to the owls. It flies low, sits for a long time on a branch of a tree watching for frogs and mice and is often seen sailing over the swampy pieces of ground and hunting its prey in the subdued daylight, which illumines even the midnight in high latitudes."

The ferruginous rough leg is a somewhat longer bird, but not much larger footed, and in the country which it inhabits the gophers and ground squirrels replace the field mouse and do immense damage. The ferruginous rough leg has been named the Squirrel Hawk because of his fondness for ground squirrels and his persistent persecution of the rodents.

In the Mostly Beneficial Class I have placed—

One species of the genus *Falco*, viz.:

F. sparverius.

Four species of the genus *Buteo*, viz.:

B. borealis, *B. Lineatus*, *B. Swainsoni*,

B. latissimus.

One species of the genus *Circus*, viz.:

C. Hudsonius.

It must be remembered here that in dividing these birds into the above mentioned groups their persecution of small birds has been added to their destruction to poultry and game birds, and this addition has in some cases caused species otherwise beneficial to be placed in the other groups, whereas were the beneficial or injurious qualities of the birds killed by these hawks determined, I am sure the percentage of injury done or beneficial forms destroyed would be in many cases reduced one half. I have, however, made

special mention of those species and have marked down the number of doubtful damage separate from the decided injuries resulting from destruction of poultry and game. For this reason if we deduct the number of cases where small birds were taken from the total number of injurious attacks made by the above five species, we may safely include three of them in the wholly beneficial or non-injurious class, while the amount of injury done by the remaining three dwindles into insignificance.

Of the first-mentioned species in this class, namely, the Sparrow Hawk, *F. sparverius*, no stronger proof of his inability to injure poultry is necessary than to know the size of the bird. He is one of the handsomest of our hawks, and a true little falcon, abundant all over the country, especially in the fall, when they may be seen sitting on nearly every other fence-post on the look-out for grasshoppers or mice. Many farmers tell me he steals young chickens, but an examination of stomachs of those shot about barns and poultry yards reveals a very different truth, in the shape of mice, and in 320 stomachs examined by Dr. Fisher, of the U.S. Agricultural Department, only one stomach contained the remains of a game bird, none of poultry, 101 mice and other mammals, while insects were found in 244, and in 53 cases small birds were found—a total of 74 per cent. entirely beneficial, and of the 17 per cent. injurious less than one-third per cent. were injurious to poultry. By far the largest percentage of the birds captured were proven to have been taken while the young were being fed, and when the parents had less time to seek regular food. During seasons when grasshoppers or terrestrial caterpillars or other insects are numerous, these birds may be seen in bands of considerable numbers, old and young alike, hunting about the woods and fields, and gorging themselves on these pests. They are confiding little fellows, and consequently, in spite of their great value, are one of the most persistently persecuted hawks. Any vandal who can handle a gun or any boy who can use a catapult or other destroying instrument, can kill the little sparrow hawk, and in cases where bounties were paid for birds of prey, a majority of the certificates were issued for sparrow hawks, and in many places it is almost exterminated where it was once exceedingly numerous.

The next species to be considered is probably one of the best known and certainly the most easily recognized in our prairie country, and especially by sports-

men. The Marsh Hawk, *Circus Hudsonius*, is familiar to every farmer who has a slough near his place and also to every sportsman who hunts feathered game in our province. He is usually seen sitting on a fence post near a slough, on some elevation in the marsh, as the top of a muskrat hut, or sailing about in a very erratic fashion over the fields or marsh, and is always readily recognized by the broad white band across the rump. Many of this species meet their death from sheer wantonness and the desire to kill or practice wing shooting, while many others are dropped by the sportsman from his cover in the marshes because of the annoyance caused by frightening the game, but few are ever picked up, and fewer still are the stomachs examined to determine the food of the bird. Many claim that the bird kills small chickens, but an examination of 124 stomachs shows only 7, or less than 6 per cent. containing poultry or game birds, and as this bird, no doubt, catches wounded ducks and other game birds which are dying in pain, and unable to escape, consequently the damage to poultry is nowhere verified by stomach examination and the assertion that it destroys game is disproven by the fact that the weak claws and bill of the bird will not permit its catching or killing game birds only when badly wounded and when they would otherwise die from injuries received from the sportsman's gun. The majority of injurious records against the bird are for small birds whose economic value is doubtful on account of inability to determine the species, and the following extracts from experiences with the bird will show that it is unable to secure game birds unless wounded:—

From E. E. Thompson's "Birds of Manitoba."

Oct. 3, 1883, near Shoal lake, west, saw a Blue Harrier trying to catch some teal in a very small shallow pond. Each time the harrier pounced the teal would dive below the surface and at the same time splash the water as high as possible. This happened several times and at length the baffled harrier gave up the attempt.

Sept. 9, Saw a Brown Harrier pounce on a prairie chicken, but the latter struggled and got free and made a dash for life with the harrier in close pursuit, but as the chicken gained at every beat, in less than 100 yards the hawk gave up the chase and turned about in search of go-pheers, grasshoppers and other game more within his reach.

These birds turn a very light slaty blue and almost white on the breast as they get older, but always have the white band on the rump. The blue hawk, as this spe-

cies, from its plumage, is called, is a much shier bird than the brown, and also capable of more remarkable feats of wing. They are sometimes seen careering up and down, almost perpendicular, for a height of from 60 to 100 feet, at the same time uttering a harsh screeching noise as though attacking something below them, and they will as suddenly turn and sail off in a lazy fashion as though nothing had happened. This is considered an eccentricity of the species, which is not accounted for and for which he is probably not accountable, unless it may be for a



Swainson's Hawk.

(*Buteo Swainsoni*.)

show of bravado before his mate, as I never saw it acting thus, only in the spring about mating time.

The four remaining species of this class belong to one genus, and while their habits are somewhat different their habits are similar. They are a heavy, broad-winged sailing and heavy bodied group, on the whole much more suited for sitting silently watching the appearance of their prey and dropping on it rather than in capturing it while on the wing.

The smallest of these is the Broad-Winged Hawk, *Buteo latissimus*, a bird somewhat rare in Manitoba and which

confines itself almost entirely to the wooded country, where they sit about in pairs on the trees or stumps watching for mice, shrews and grasshoppers, and save for occasionally dropping down on a small bird they are wholly beneficial, as out of 90 stomachs examined only 2, or less than 3 per cent. contained birds, none of them poultry, while the remainder contained mice and other mammals, insects and reptiles. This hawk is a stupid bird, allowing of a near approach, and are consequently shot down wherever the wandering shooter chances to come upon it.

The Red-Shouldered Hawk, *Buteo lineatus*, is also an inhabitant of the more wooded country, and is, consequently seldom met with in this part of the province, being even more secluded in its retreat than the broad-wing. On an examination of 220 stomachs, only 3, or about 1½ per cent., contained poultry, while about 5½ per cent. had small birds, the balance containing mice and injurious mammals, insects, fish and reptiles. Two contained offal, showing the species to be almost as fond of offal as of poultry.

The Red-Tailed Hawk, *Buteo borealis*, is the largest of our common hawks and is universally called the hen hawk by farmers. It frequents the vicinity of woods or fresh clearings, where it sits upon a branch of stump diligently watching for mice and shrews, which are so common about old stumps and logs in such places.

Occasionally, should one of these spots be near the house or the farmyard, and the poultry stray in that direction, he will steal a hen, but it is usually the old and enfeebled veterans who are not quick enough to escape his awkward pounce. Even the proportion of such cases amounts to about 10 per cent. of the 562 stomachs examined, consequently like his brother *Buteo*, were it not for the small birds he drops on occasionally he might be placed in the beneficial class.

The remaining number of the mainly beneficial class is possibly the most commonly known of our large hawks, and is also familiarly dubbed the "Hen-hawk" (*Buteo Swainsoni*). It is doubtful, however, if Swainson's hawk would ever chase a chicken past a gopher, or could catch good healthy poultry or small birds. As in the case of his brother *borealis*, it usually happens to be the old rheumatic straying fowl that he catches and which are not worth much more than the cost of the powder and shot to shoot the hawk.

The usual position for this bird is bolt upright on a hummock of earth or the hill thrown up by a gopher or badger. Here it will sit for hours scanning the field, and woe to the gopher or mouse

who will stray from home when Swainsoni is on the alert. He usually only makes one or two sudden pounces and rises with the animal in his claws, carrying it either to his young or alighting on a prominence to devour it himself. It is estimated that a Swainson hawk would catch and eat at least five gophers a day, and where one pair are at work they would destroy ten gophers a day for their own food, and at least as many more while feeding the young for about three weeks. At this rate they would feed the young 210 gophers in the three weeks, and during the six months, at least, that these birds are with us they would destroy a great number of these pests.

If the amount of grain eaten by gophers be taken into account it will be seen what a friend to the farmer *Buteo Swainsoni* is. Should not this be more than sufficient to place protection on this hawk? Yet he is a robber and a hen-hawk. If we give each bird one hen a week while with us, which I am satisfied, is double the average taken anywhere by these birds, the value of the poultry thus stolen is, at a liberal estimate, of 25c. a head, for each pair of hawks, \$13.50 for the entire season, thus leaving a cash balance to their credit of ten times that amount at the end of the season.

Of this species Dr. Coues speaks in his "Birds of the Northwest," observations of 1883:

"The quarry of Swainson's Buzzard is of a very humble origin. I never saw one stoop upon a wild fowl or grouse, and though they often strike down rabbits, like the red-tails, their prey is usually nothing larger than gophers. Though really strong and sufficiently fierce birds, they lack the snap of the falcons, and I scarcely think they are quick enough to catch little birds very often. I once saw one make the attempt at a lark-bunting. The hawk poised in the air about twenty yards for fully a minute, fell heavily with an awkward thrust of its talons and missed its prey. The little bird slipped off between its feet, badly scared, no doubt, but still uninjured, while the enemy flapped away sulkily to prowls about a gopher hole for his dinner, or take pot luck at grasshoppers."

HARMFUL HAWKS.

Now that we have reached the group which may be considered harmful and for whose depredations the majority of hawks and owls suffer, as did the children of Israel for the sins of one family, it will be necessary to show to what extent they are

While the falcons capture their prey by superior flight across the country, the accipitrines, although strong flyers, capture the most of their prey by short, rapid dashes, or by sharp and skilful turns upon it, cutting off opportunities of escape, and more frequently capturing the victim before the presence of danger is suspected.

The largest and most powerful of these three is the goshawk, *Accipiter atricapillus*, which is commonest with us during the fall and winter months, when those which build with us are reinforced by large migrations from the north, and they may be found about the woods, where they hunt rabbits and grouse with the greatest persistency, so that in many places it is known as the partridge hawk. They do not reach the full state of blue plumage till the fourth or fifth year, and the older birds also seem to have much more courage and agility than the younger birds. I have seen one of these birds dash upon a rabbit in the woods, kill it with a blow and fly off with it almost before I had time to realize what was taking place or could raise the gun to fire. When wounded they are exceedingly fierce, and will seize dog or man with their powerful claws without any hesitation, inflicting very disagreeable wounds.

The record of stomachs shows in twenty full stomachs ten contained mammals, chiefly rabbits, while the remaining ten contained poultry and game and small birds, thus showing the species as a whole to be equally beneficial and injurious. As in many cases, the hare (*Lepus Americanus*) becomes a nuisance to growing trees, and as many of these stomachs show the game birds are their prey, and as the goshawk remains either in or near the bush most of the time, his beneficial qualities overbalance the injurious, save where the poultry yard is in close proximity to the bush.

The acknowledge poultry thief-in-chief of the hawks is Cooper's Hawk (*Accipiter Cooperii*). Somewhat smaller than the goshawk, it lacks none of its dash, and is a close second to the falcons in speed of flight, as well as being strong enough to carry off full-grown chickens, grouse and rabbits. These hawks are clever, shrewd and cunning, soon learning the ways of man, and usually pay repeated visits to the poultry yard, coming unobserved and escaping with a sudden dash (and a hen) before the surprised owner, who may have been on the lookout, has time to turn and grasp his gun. In cities, where the use of firearms is prohibited, this bird has learned to lurk among the evergreens in private grounds, whence it dashes out into the thoroughfare upon the unsuspecting spar-

rows and pigeons. Of this species Dr. Fisher says:

"If they confined their persecution to the pesky little sparrow, they would be public benefactors, as the problem of keeping that imported nuisance in check would then be solved."

The stomach records show in 84 full stomachs, 34, or about 36 per cent., poultry, 16 per cent. mice, mammals and insects, and the balance other birds of doubtful economic value—not a terrible record for the most injurious species.

The last of the hawks we have to deal with is almost a twin brother of Cooper's hawk, and so near does it approach it in size that it is at times difficult to determine a small Cooper's hawk from a large sharp-shinned, unless one has a sight of the rounded tail of the former species.

The sharp-shinned hawk (*Accipiter velox*) is a well-known species of our small hawks, and may be seen during the spring and fall perched upon a telegraph or fence post or sailing about over the woods and fields in search of prey, the long square based tail serving always as a mark of identification. They are bold, daring little fellows, and do not hesitate to attack birds much larger than themselves. They are fond of the vicinity of man and do good service about settlements in persecuting the English sparrows. The large majority of the bad records against them is on account of their raids upon small birds, in cases the economic values of the species is doubtful, and I am certain that in the fall this species does good service in persecuting the blackbirds, which are so numerous in the province, and this at a time when the blackbirds are destroying grain. The table of stomach examinations show *Accipiter velox* to be very slightly injurious to poultry, as in 107 full stomachs only six showed signs of poultry or game birds (less than 6 per cent), while eleven contained mice and insects, the remainder small birds; so that if English sparrows and blackbirds could be proven to form the preference in these cases, *Accipiter velox* might be considered a mostly beneficial species, instead of harmful.

FAMILY STRIGIDAE.

The owls, for several reasons, are a very interesting and peculiar family of birds. They are chiefly nocturnal, continuing through the hours of darkness the persecution carried on upon our small animal pests by the hawks in the daytime. But, though they work under shadow of darkness, they do not escape the persecution which bigoted prejudice and a little knowledge are pleased to inflict upon all birds of prey.

The eyes are set in sockets facing forward, which prevents the bird from moving them without turning the head. This, combined with the facial disks, give it a solemn and dignified expression and a human resemblance, which is at times weird and awe-inspiring, while their almost human voices add much to the superstitious regard in which they are frequently held. The fact of their hunting chiefly by night has given many the idea that they cannot see by day.

They seize their prey in their talons, and, where size will permit, swallow it whole. The plumage is soft and fluffy, enabling them to withstand extreme temperatures at times, and the very soft plumage under the wings and on the body surface makes its progress perfectly noiseless, thus permitting its close approach upon its prey before the danger is realized.

I do not propose to go to either extreme in classifying the owls, but place them all in the mostly beneficial class, as all have records of occasionally capturing a small bird, while the one species which is considered injurious more than compensates for the injury by the number of injurious mammals destroyed, and I am confident that were the poultry properly penned up at night, it would effectually prevent any erratic invasions from the owls.

Of the twenty known North American species, eleven may be recorded as regularly Manitoban; some few are migratory, but the majority, especially those inhabiting the deeper woods, remain with us all the year. One of the chief causes of migration among the owls is the amount of snow, which at times cover the food up so completely in their retreats that the birds are forced to seek it in other quarters. This is the reason why owls of different species are much more numerous some seasons than others.

The eggs of all owls are uniformly white and considerably rounded. In the genus *Bubo* we have two forms, which are considered distinct species, although a microscope is almost necessary in order to locate the line of separation.

Of the great horned owl *Bubo Virginianus Subarcticus* is the common form, while *Bubo Virginianus arcticus* is a lighter, and possibly smaller, variety, with a somewhat more northern range. As some five varieties of *Bubo Virginianus* are known to exist, and as all these varieties interbreed where opportunity arises, it takes an expert to search out the pedigree of a horned owl and locate the species or variety. If the locality of collection is not known, it may be any of the five.

They are called the feathered tigers by many ornithologists, and certainly their

untamable ferocity is deserving of the name. They are bold and unexcitable; comparatively easy of approach, and when wounded present a defence worthy of any animal twice their size.

They are the largest and most powerful of the owls, and are credited with doing the greatest damage to poultry and game; they will pay repeated visits to the hen roost where access can be gained, and carry off the largest size fowls. Owls will also capture the grouse and partridge and are of great service in exterminating the rabbits where these animals are numerous. The attacks on the grouse and poultry are made chiefly during the winter, when other food is covered up and when any half-human poulterer would have all crevices small enough for an owl to look through,



Burrowing Owl.

(*Speotyto cunicularia hypogaea*.)

much less fly through, closed up to keep out frost and snow. Were there no owls to carry them off in cases of this kind more poultry would be thrown out, crippled and killed by frosts than the owls eat. I have kept many of these birds alive, and they always prefer rabbits, rats or mice to birds, and an owl can be kept in a more healthy condition with an occasional rabbit than with birds. The record for this bird shows that in 110 full stomachs examined, 80, or over 72 per cent., contained mice, injurious mammals and insects. Of the remainder, eight contained small birds, leaving only 20 per cent. injurious, and these to be divided among game and poultry. Shut up the poultry at night and cut off 10 per cent., which the owl will make on rabbits.

Second only to the horned owl in size is the snowy owl (*Nyctea nyctea*), which is a regular winter resident in greater or less

numbers, corresponding to the amount of snow to be found north of us. They frequent the stacks and outhouses about the farm, and often remain for days about the one locality, unless shot down by the farmer, who immediately concludes that the owl must die because he is on the barn or stack, without any consideration as to what he is there for. I will not go extensively into this species, as I have already in two papers dealt with its economic value, simply quoting figures from the last article, which appeared in a recent issue of *The Nor'-West Farmer*.

In the season of 1896-7, I received some 70 snowy and 20 horned owls. The stomachs of the former failed to reveal the trace of poultry, but contained from four to ten mice, the result of the previous night's hunt about the stacks and barns, where they were killed. From this revelation and the result of an experiment with living specimens, it will be seen that the birds required at least seven mice or their equal in other flesh daily to keep them in good condition. The first birds were received about November 15 and the last about March 15, so that in 120 days they would have fed, if not disturbed, in the locality, and in which time they would have consumed over 840 mice each.

The amount of grain destroyed by mice is so great that the service rendered by the owls in their destruction will be readily seen. Dr. Fisher's record of stomachs of this species shows two in 29 full stomachs (7 per cent.) contained poultry or game, while 20 contained mice and other mammals, the balance other small birds.

This is one of the few species of owls which hunts by day as well as by night, but it is always most active at twilight and early dawn.

Syrnium nebulosum, the Barred Owl, comes next in size, but it is considered rare in Manitoba. I have never secured it, and have only seen one specimen in two and a half years. They frequent the deeper woods, seldom showing themselves in daylight. Regarding the defective vision of this species, Audubon speaks of seeing one alight on the back of a cow, which it left so hurriedly on a movement of the animal, as to show it had mistaken it for a more stationary perch. Another record is made of a collector having one alight suddenly upon the barrel of his gun, which it left as suddenly, but not soon enough to save its life. This is authenticated by Mr. Girard, in his "Birds of Long Island."

The stomach record of the species shows that in 80 full stomachs five contained poultry or game and 13 other birds, while all contained remains of mice, injurious mammals, reptiles and insects.

This owl is usually resident wherever found.

Ula cinerea (Gmel.) The great gray owl is at first appearances a large and ferocious bird, but upon examination is found to be nearly all feathers, the body and limbs being much smaller than the barred owl. It is the most northern of any in its range, and inhabits the wooded countries, and is nowhere common, save in seasons when the great amount of snow and ice in its compels it to move south in search of food, which consists almost entirely of mice and small mammals. In nine stomachs examined only one contained trace of feathers, while all had mice or other mammals. This certainly proves the great gray owl as the most beneficial of his class, but his small numbers render his services less effective than many commoner species.

Asio Wilsonianus. The Long-Eared Owl and the Short-Eared Owl (*Asio accipitrinus*) are two species of much the same size, the former inhabiting the bush and small bluffs, while the latter lives in the open marshes and fields. Both are quiet and inoffensive birds and are constant enemies of the mice and other small mammals. The long-eared species is the more nocturnal of the two, while neither species are wild and permit of a close approach, making them excellent targets for the ruthless sportsman out to kill. The record for *Wilsonianus* is in 92 full stomachs 90 contained remains of mice and other mammals, insects, etc., while only one revealed a trace of a game bird and 13 contained traces of other birds.

The short-eared owl hunts frequently by day, and during migrations they move about in flocks in the twilight in search of prey. This bird is frequently dropped by the wanton sportsman for practice as it rises suddenly in front of him in the field or marsh, and is usually left to rot or die from wounds.

Their stomach record shows in 87 full stomach all contained mice, small mammals or insects, and only 11 showed any trace of small birds, thus proving him exceedingly beneficial.

Syrnium ulula caparoch. (The Hawk Owl) is a winter visitant with us, and while here hunts during the day as much as by night, much more so than any of the owls from which characteristic it derives its name. While with us it feeds upon mice and small mammals almost entirely, with an occasional small bird, but as I have no stomach records, I can say nothing more than that all cases which have come under my notice have proven the bird to be entirely beneficial. In the vicinity of the Riding Mountains the bird is very numerous during the winter. It never moves

farther south, except when compelled to on account of snow and ice.

We now come to the two smallest species of owls found in Manitoba.

Richardson's Owl (*Nyctala tengmalmi richardsoni*), and the Saw Whet Owl (*Nyctala acadica*).

Both these birds are resident practically wherever found, Richardson's owl being possibly the most secluded of the two. Both are nocturnal, and in daylight, with slight precaution, may be caught in the hands. I have found mice an absolute necessity to keep them alive, consequently these must form the greater portion of their diet. Certainly neither of them are large or ferocious enough to do much damage to poultry. The records for the Saw Whet Owl are in 19 full stomachs, one contained a small bird's remains, 17 mice and one insect.

Lastly, I refer to a species not previously recorded for Manitoba, but which is now becoming numerous in many localities, namely, the Burrowing Owl (*Speotyto cunicularia hypogaea*), of which we have all heard more or less in connection with his supposed association with the prairie dogs and rattlesnakes. The truth of this is that the little owl drives out the gophers and prairie dogs and appropriates the burrow for his own home, and the finding of the rattlesnakes in the same locality is no proof of their living with the owls. Dr. Coues, who first upset the story of the harmonious association of the three forms, says the owl is a match for both old prairie dogs and rattlesnakes, living largely upon the young dogs. They are peculiar looking little birds, with their long, slender featherless legs, so different from all other owls, which makes them look somewhat top-heavy. Capt. Bendire, in his life histories, relates an experience in feeding two specimens in captivity, in which the owls killed with ease, and devoured with equal ease, four Townsend's ground squirrels, animals considerably larger than the birds, in one day. Every day of their captivity they eat more than their own weight, which will give a slight idea of what a growing brood will require, and as the food is almost entirely vermin, they are extremely beneficial agents and deserving of the fullest protection. Their advent into Manitoba can therefore be looked upon with favor, more especially on account of their fondness for gophers, and among them the pocket gopher, which tunnels so much under ground, heaving up heaps of earth and doing great injury to growing crops. This animal works mostly at night, and the burrowing owl is the best adapted species to act as constable and intercept him at his

work, arrest him, judge and condemn, and finally dispose of him to the owl's satisfaction.

CONCLUSIONS.

Having collected together the foregoing facts relative to the economic relations of the individual species of the birds of prey, let us now briefly review them, and see what conclusions may be drawn from them. In the first place, we have three species proven absolutely beneficial, with no records of destruction of either poultry or game birds.

In the second group we have six hawks and eleven owls, mostly beneficial, which average only 16 1-3 per cent. injurious, and from this small percentage we must deduct 12 per cent. for the small birds taken, whose economic value is doubtful, because we have no knowledge of the species, which leaves a grand total of 4 1-3 per cent. of 17 common species of birds of prey injurious to poultry and game combined, while the remaining 82 2-3 per cent. are entirely beneficial in their destruction of agricultural enemies. Is it justice to slaughter 84 innocent birds because four in the hundred fancy poultry or game? On the contrary, it is very unjust, and therefore so when we consider that these 84 innocents have been diligently working in our interests and yearly saving us many times the value of all the poultry we own.

Reviewing the records of the harmful group, what do we find? Five species are credited with doing the damage for which the other 23 species suffer. The question now is, what is the injury they do? The average injury of these amounts to only 25 per cent. to poultry and game, while an equal percentage is proven to be beneficial, the remaining 50 per cent. being destructive to smaller birds. Now, it has been shown that the Peregrine falcon seldom visits the farm-yard, but follows the game, which will greatly reduce his injurious effects upon poultry. It has also been shown that the three species most injurious to small birds are most so to two pests, the English sparrow and the blackbird, and for this reason we can reduce their injurious qualities in this respect at least one-half. Consequently, we have at least 50 per cent. of the most harmful hawks directly beneficial to agricultural interests, while only 25 per cent. are injurious to poultry and game combined, and the remaining 25 per cent. to birds of doubtful economic value.

From these conclusions, I think it only justice to the interests of our country that the birds of prey should be included in the Act for the protection of birds beneficial to agriculture.

Now, in order that the observer may be able to determine the most injurious species from the harmless and beneficial, I shall again refer to their different characteristics.

When a hawk is observed beating steadily back and forth, sailing and dodging about the prairie or marsh, or sulkily and indolently perched upon a post, branch or clod of earth, usually disregarding the approaching team or pedestrian on the highway, it may safely be concluded that this is not a thief and that he seems to realize it, and is therefore undisturbed by approach. And should one be observed about the farm-yard perched on the stack, barn or fence-post, even though poultry are about, he will not bother them, for he is after mice. But should a hawk be observed bearing down upon the place at an unusual rate of speed, never altering its course, and dashing among the startled fowl, you may know it is a thief, and must

be ready for him before he arrives, in order to frighten him off or get a shot at him as he whirls behind the barn or stack with a hen. Should you not be fortunate enough to see him coming, and suddenly see the streak of feathers flash past and hear a disturbance among the fowl, if you are not very sharp you will not even see him dodge off with the fowl and will not realize what has happened until you count your poultry, as when this bird makes the fatal swoop, nothing but death can stop his attack, and an army of musketry and dogs could not make noise enough to disturb him. Consequently, it is only on chance occasions that an opportunity is given to punish the culprit, unless, after repeated visits, a watch is kept for the approach, a quick shot is made and the thief dropped, and this invariably results in the loss of more time than the value of the poultry taken.

SMALL MAMMALS OF MANITOBA DESTROYED BY BIRDS OF PREY.

The small mammals which constitute the greater portion of the bill of fare of the birds of prey, and those most destructive to agricultural interests, are mice and gophers. Of the former group there are, besides the domestic mouse, three species which may be considered common, and whose ravages are worthy of attention. Chief among these in numbers and destructiveness is the common field mouse (*Arvicolia riparius*). This chunky, short-tailed, unintelligent-looking little animal is familiar to nearly everyone, being of wide distribution in our province, and it will always be found in greater or less numbers wherever there is a grain field or granary. The field mice nest below the ground in the fields, so that they are constantly in the midst of abundance of food with a minimum of exposure to enemies. They are exceedingly prolific, and it is estimated that the increase under favorable circumstances from one pair of mice would be over 14,000 mice in five years, if we allow each pair to breed for two years, as each pair will raise at least ten young each year. The numbers of these animals in a given district would seem almost incredible to the majority of people, as the animals are mostly nocturnal, and, unless disturbed by daylight, they never move from their hiding place, and when disturbed they readily hide behind any cover available. On account of the favorable protective grey color

of the animal, they generally escape observation, unless one is especially looking for them. On one occasion, in September, 1897, I was desirous of securing some of these mice. I visited a field where threshing was in operation, and, with two boys, I followed the stook teams about, and in less than one acre of ground captured sixty specimens, and during this time as many more escaped uncaptured or were killed and eaten by a dog in attendance. The boys subsequently visited the same field for the sport of killing the animals, and informed me that my catch was only an average to be found over the whole section. This would mean, allowing two-thirds the number captured to have escaped, 100 mice per acre, or 64,000 mice on that section. Now, as by experiment I proved that 50 mice would destroy one pint of grain daily, and as this grain was standing stooked for about three weeks before threshing, these animals would have consumed large quantities of grain. At this rate a few pairs of mice wintering in a stack or granary would be very damaging to the farmer in one season. This is the species which most frequently falls a prey to the rough-legged hawk during twilight or to the owls which hunt by night. A pair of owls or hawks about a grain stack during the harvest will do much towards the extermination of these pests. Seeming to know their own powers of hiding, they are very bold and

unexcitable, and once in hiding are not easily dislodged as other more excitable species would be. As they are so seldom seen, and as the grain yield is always speculative, their destructiveness is not apparent, save in a granary, where the quantity of grain is known; but, if any farmer takes the trouble to look into the matter himself, he will not be long in securing convicting evidence of the strongest character against this pest and ample evidence in favor of the protection of their destroyers — the hawks and owls.

Of the second species, the red-backed mouse (*Arvicola Gapperi*) or Gapper's mouse, no special mention is necessary, beyond the description of the animal, which

depth along the fence lines, roadways and uncultivated fields, and although they seldom burrow in the grain fields, they pay them regular visits both to feed upon and carry off large quantities in their cheek pouches to be stored away in their burrows. The damage done by these rodents is, as in the case of the mice, not apparent, or at least, not credited generally to the agency of these animals, but if we estimate one pint of grain daily to each ten gophers, and with this number of animals along each fence line of a grain field, it would mean two quarts of grain daily destroyed. This amounts to almost two bushels of grain in a month taken by these forty animals, and this in the spring dur-



Common Striped Gopher. (*Spermophilus tridecemlineatus*.)

is, if anything, a trifle smaller than *riparius*, and the whole back is reddish-brown. It is found usually in company with the field mouse, and their habits are about identical, save the *gapperi* may be more numerous in the vicinity of fresh clearings, but it is never as numerous as the better known species.

The notoriety of the ground squirrels or *Spermophiles*, is far more general among agriculturists than that of the mice, to which animals they are second only in numbers. Being much larger animals, their destructive qualities, which are enormous, would prove the ruination of the country were they as numerous as mice. They construct burrows of great length and

ing seeding would mean a great drain upon the fall yield. Taking the annual increase of these animals to average five young pair, we would find 100 young gophers to cut down the growing grain through the summer and 140 gophers to attack the ripening and standing crop in the fall, and it would require nearly two bushels per week at the foregoing rate to feed this number of animals. I have placed the average at 40 gophers per field, which I consider a very small average, as in some larger fields this number can frequently be found upon one side of the field. When undisturbed for a time these animals become quite bold and unconcerned, and complaints have been made that the larger

species will at times seize upon young chickens and carry them off. Certain it is that they are fond of flesh, as they will kill and eat birds while in captivity, and for this reason I believe they do much destruction among our smaller ground-nesting birds. They are, however, credited with destroying quantities of injurious insects, chiefly in the larval form, but any beneficial qualities in this regard are quite offset by their destructiveness. It is therefore plain that agriculturists are very unwise to destroy the hawks which prey upon these pests and leave them to increase and continue their depredations unchecked.

The most generally known spermophile of the three species inhabiting the western

of wood, a small clump of grass or a fence-post, which usually conceals the entrance to the burrow. As this species frequents the grain fields and more open ground, it is the usual prey to the large hawks, which may be seen beating up and down the fields, and these hawks know that when a gopher disappears into his burrow he is full of curiosity and will soon come out again to see what frightened him. The hawk, by remaining motionless at the edge of the hole, is able to catch the animal suddenly upon his reappearance, if he is not meanwhile shot as a chicken thief.

Of the two remaining species, Franklin's spermophile (*Spermophilus Franklini*), gray gopher, gray squirrel or brush gopher,



Gray Gopher. (*Spermophilus Franklini*.)

prairies, and certainly the most generally destructive to grain crops, is the striped spermophile. *Spermophilus tridecemlineatus*, more familiarly known as the striped gopher. This species ranges from the Red river valley across the province, and from the U. S. to latitude 53 deg. n. It is possibly most common in the district east of the gravel ridges and hills, and can be seen along every roadside and in almost every field in greater or less numbers. Scurrying along in a mouse-like fashion to the entrance to its burrow, where it elevates itself upon its hind legs and remains motionless as a stake until approached too closely, when, with a shrill whistle or trill, it disappears apparently into a block

as it is also called, is a much larger species than the striped spermophile, but is not generally so numerous and is destructive according to its numbers. The gray gophers range the entire fertile belt of the prairie country from the Northern States to Carlton House on the Saskatchewan river. They prefer the vicinity of rank herbage or brush, and their food is more of a wild nature, unless they happen to be in the vicinity of a grain field. At such times they can do great damage, if found in any numbers. This species will most frequently fall a prey to the red-tailed hawk and kindred species which sit about these bushy localities alert for straying rodents, and also to the diurnal hunting owls,

whose noiseless flight allows of an unsuspected approach. They are a much more awkward animal in motion than the striped gopher, and are, therefore, more easily captured. If they are once exterminated in a locality they do not return for some time, as their rate of increase is not so rapid as that of the other species. This species is distinguished from the succeeding by the long bushy tail and uniform gray color.

The remaining species is Richardson's spermophile (*Spermophilus richardsoni*) a shorter-tailed species than *Franklini*, and the tail is not nearly so bushy. Its range in the more gravelly and hilly portion of the province from Dakota north to Carlton House on the Saskatchewan river and west of a line drawn through Carberry and Petrel. It resembles the prairie dog, (*Cynomys ludovicianus*) in both form and color. It is abundant in fields and fresh clearings, and even in populous districts in many places is exceedingly numerous. Many western farmers, who do not know the Franklin spermophile, complain of this species, and there is little doubt that it is on account of the excessive numbers that the damage done is so apparent. They are bolder and more savage than either of the other species, and this would make them an easier mark to the larger hawks. As all three species of spermophiles are diurnal (being most active in morning and evening), the owls (save the few diurnal hunting species) are unable to persecute them, and as they all hibernate during cold weather and store up food for inclement weather, they escape the persecution of the winter visiting species of hawks and owls, and therefore have that much better opportunity to increase.

The term gopher, as applied to the spermophile, is inappropriate, as the gophers are a different class of animal, the spermophile being more correctly speaking ground squirrels, while the succeeding species is the only gopher we have in Manitoba.

The only remaining grain-destroying mammal to be noted is the gray pocket gopher (*Thomomys talpoides*). A fine-furred, thick-set animal, approaching the

size of the striped gopher, but much thicker proportionately. The cheek pouches are separate from the mouth opening and can contain a considerable quantity of food. The legs are short and thick, while the forefoot is developed into a long claw, especially adapted for digging. The tail is short and almost devoid of hair. This animal spends most of its time below the surface, only appearing to throw out the earth which it is constantly loosening as it continues its tunnelling. This work, the result of which is seen in the mounds of fine earth thrown up in the fields, is doubly destructive, in that it buries much of the grain too deep to permit of its growth and also undermines the roots of much of the growing seed in the vicinity. It is upon the roots of these grains and shrubs that the animal feeds. Occasionally it pulls down the heads of grain into the burrow, but as a rule it is content to feed upon the roots and underground growth. The species is especially destructive to young trees, and will destroy whole orchards and groves by cutting off the roots of the trees. They will also destroy large quantities of turnips, carrots, potatoes and other vegetables. As this animal is chiefly nocturnal, it would be more a prey to owls than hawks, and, as it seldom comes far above the surface, about the only species which can combat them is the little burrowing owl, which seems to be extending its range into our country. Badgers and weasels persecute these gophers persistently, the badger digging the gopher out, while the largest weasel is able to enter the tunnels with ease, and this invariably results in a dead gopher. There are various methods adopted to kill off all these destructive animals at times, when their numbers increase abnormally. It can no longer be disputed that as an agency toward the perpetual limitation of their numbers, the hawks and owls, though long unjustly persecuted, are certainly deserving of our respect and protection. We can well spare an occasional young chicken or an old rheumatic fowl to these birds in return for the number of the pests they annually destroy.

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